## REMARKS

Applicant would like to thank the Examiner for the careful consideration given the present application. The application has been carefully reviewed in light of the Office action, and amended as necessary to more clearly and particularly describe the subject matter which applicant regards as the invention.

Claims 1-3, 5-15, and 17-26 remain in the application. Claims 4 and 16 have been cancelled. Claims 1 and 9 have been amended to include the claimed features of claims 4 and 16 respectively. Claims 1-6 and 18-23 stand rejected under 35 USC 102(b) as being anticipated by U.S. Patent 6,467,605 to Head (hereinafter Head '605). For the following reasons, the Examiner's rejections are traversed.

The present invention is directed to a method of supplying workpieces to workstations (MC1 – MC4 in Fig. 2 reproduced below) using an autoloader. The method includes receiving one or more signals from individual workstations; signal types including call signals, ready signals, and error signals. From a group of received call signals, the oldest call signal that has not been responded to and has not come from a workstation that has also transmitted an error signal is responded to first. Response includes moving a selected workpiece from an input area to the selected workstation that transmitted the selected call signal. A ready signal or error signal is sought from the selected workstation. If a ready signal is found, the selected workpiece is loaded into the selected workstation. If instead an error signal is found, the process starts over and the next oldest call signal is responded to. Accordingly, the present invention is directed toward a manufacturing environment wherein multiple workstations

are available to perform the same manufacturing or machining task (i.e. parallel

manufacture).

FIG. 2
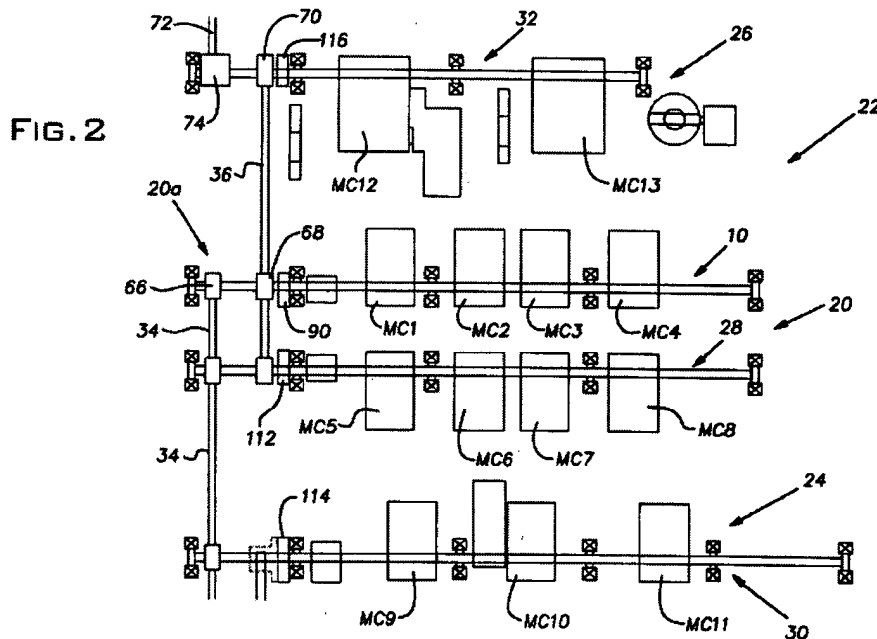
Head '605 discloses an automated computer controlled assembly line preferably

for use in the manufacture of semiconductor circuits and devices, but also for

automobile, engine and tire manufacturing and assembly. This method of operation is

particularly useful where assembly lines or portions of assembly lines are comprised of

machines placed side by side in a row. Manufacturing or processing takes place by

transporting a workpiece from work station to work station and from machine to

machine. Figure 10 shows a loading machine having three different workstations.

Different manufacturing or processing can take place on a single assembly line by

varying or bypassing altogether an individual machine's operation or by skipping some

of the machines and hence some of the step in the assembly line or by repeatedly passing a workpiece through the same machines to perform similar steps. A machine may be part of a forked assembly line, where *a given machine may then have more than one exit path or more than one input path where one path is designated as normal and any additional paths would be considered abnormal. Between any two machines or workstations, the flow of workpieces is still from upstream to downstream, regardless of the path.* [Column 11, Lines 60-65] Thus, the Head '605 method is directed toward a manufacturing environment in which each part moves in a general upstream to downstream manner, although certain operations in the path may be skipped or repeated. Via asynchronous operation a workpiece may be processed at each work station regardless of the status of any other workpiece or work station in the line. In operation, a computer system controller will process a request from a downstream work station requesting a workpiece from an upstream work station.

Fig. 10
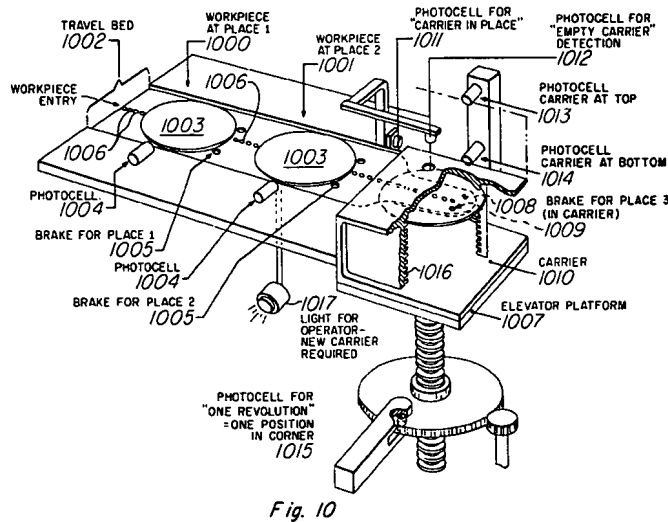
Once the upstream workpiece is ready to be sent, the downstream work station

will be prepared for its receipt. After receipt of the workpiece at the downstream work

station, an acknowledgement is provided. Regarding errors in the system, if a work

station is declared inoperative, the work stations of the same machine may continue

their work function until workpieces in them are brought to a safe condition. When the

workpieces are in a safe condition in all of the work stations of the machine, the

machine is declared inoperative and an operator will be alerted so that the machine can

be repaired and returned to service without damaging any workpieces other than

possibly the one workpiece in the failed segment.

With regard to claim 1, the Head '605 reference fails to disclose within its

methods a step whereby "for all received call signals, determining a selected one of the call signals, which is the oldest one of the call signals that has not been responded to and has not come from a workstation that has also transmitted an error signal" and further "responding to the selected one of the call signals by moving a selected one of the workpieces from an input area to a selected one of the workstations, which is the workstation that transmitted the selected one of the call signals" as required. Head '605 does not disclose a configuration where numerous call signals are received from various work stations, but rather describes more of a patterned system. Head discloses processing or manufacturing on a single assembly line or by varying or bypassing altogether an individual machine's operation or by skipping some of the machines. But Head '605 does not disclose determining a path to a machine based on a call, but rather suggests that the path of the progression of work from station to station is predetermined and known before the manufacturing process is started.

Additionally, Head '605 fails to disclose moving a workpiece to a work station calling for the workpiece, but not immediately loading the workpiece into the workstation. As a result Head '605 does not then disclose "if a ready signal has been received from the selected one of the workstations, loading the selected one of the workpieces into the selected one of the workstations" as required by claim 1 and the claims depending therefrom. Instead, Head '605 discloses maintaining a workpiece at an upstream workstation until the upstream workstation has completed its operation and then, when both the upstream and downstream workstations are prepared to commence a transfer, the workpiece is directly loaded into the downstream work station. Accordingly, it is submitted that the method of claim 1 is not anticipated by

Head '605.

With additional regard to claim 3, Head '605 does not teach or suggest "moving the carriage with the worked-upon one of the workpieces to a drop-off station; and depositing the worked-upon one of the workpieces in the drop-off station" as required. Head '605 simply teaches moving the workpieces from one station to another without any sort of intermediate dedicated drop off position. Accordingly, the method defined in claim 3 is not anticipated by Head '605.

With additional regard to claim 6, Head '605 does not disclose the use of an autoloader having the flexibility to supply workpieces to work stations in a fixed sequence, which is continuously repeated (e.g. MC1, MC2, MC3, MC1, MC2, MC3), or in a sequence dictated by vacancy at a workstation. Thus, if a single workstation completes operations more quickly than others, or alternatively encounters an error condition, that workstation can be fed more frequently or avoided altogether, respectively.

In view of the statements above, Applicant requests reconsideration and withdrawal of the rejections of claim 1 and claims 2-3 and 5-6 depending directly therefrom.

With regard to claim 18, as previously stated with respect to claim 1, Head '605 does not disclose supplying workpieces to "workstations based on the chronological order of the receipt of the call signals from the workstations, such that the workstation that transmits a first received one of the call signals is supplied with one of the workpieces first" as required. As previously stated, Head '605 discloses a patterned processing sequence, not a situation where multiple calls requiring prioritization are

received. Reconsideration and withdrawal of the rejection of claim 18 is requested.

With regard to claim 19, as previously stated, Head '605 does not disclose moving a workpiece to a work station and waiting at that workstation until the absence of an error signal is confirmed before loading the workpiece into the workstation. Further Head '605 does not disclose, "moving said one of the workpieces to a next one of the workstations that transmitted a call signal that was received subsequent to the call signal from said one of the workstations" if "said one of the workstations has transmitted an error signal." Reconsideration of claim 19, and claim 20 that depends therefrom, is requested.

With regard to claim 21, for either the first or second zone a step wherein for all received call signals from the workstations, "determining a selected one of the call signals which is the oldest one of the call signals that has not been responded to and has not come from a workstation that has also transmitted an error signal" is a step not disclosed by Head '605, as previously stated during the discussion of claim 1. Reconsideration and withdrawal of the rejection of claim 21 is requested.

With regard to claim 22, as previously stated, Head '605 does not disclose moving a workpiece to a work station and waiting at that workstation until the absence of an error signal is confirmed before loading the workpiece into the workstation. Reconsideration and withdrawal of the rejection of claim 22, and claim 23 that depends therefrom, is requested.

Claims 7-17 and 24-26 stand rejected under 35 USC 103(a) as being obvious in view of Head '605. For the following reasons, the Examiner's rejections are traversed.

Claims 7, 8, 14, 15 and 17 depend directly from claim 1. As previously stated

regarding claim 1, the Head '605 reference fails to disclose within its methods a step

whereby "for all received call signals, determining a selected one of the call signals,

which is the oldest one of the call signals that has not been responded to and has not

come from a workstation that has also transmitted an error signal" and further

"responding to the selected one of the call signals by moving a selected one of the

workpieces from an input area to a selected one of the workstations, which is the

workstation that transmitted the selected one of the call signals." Rather, as noted

previously, Head '605 teaches a computer system controller that will simply process a

request from a downstream work station requesting a workpiece from an upstream work

station. The teachings of Head '605 also do not suggest these steps in the claimed

method of operation. Rather, Head '605 would have to be modified to arrive at the

method defined in claim 1, from which claims 7, 8, and 14-17 depend. Insofar as the

Examiner has not indicated any suggestion or motivation to support modification of the

Head '605 teachings, it is considered apparent that a prima facie case of obviousness

has not been established. Reconsideration and withdrawal of the rejection of claims 7,

8, 14, 15 and 17 is requested.

With further regard to claim 7, and additionally with regard to claim 9, Head '605

does not teach or suggest a group of workstations that perform identical machining

operations on workpieces as required. The Examiner states that the "type of operation"

has not been proven by applicant to be critical to the operation of the system. Applicant

believes the Examiner has misinterpreted this aspect of the invention and its criticality.

As such, Applicant has amended claims 7 and 9 to more clearly identify this aspect of

the invention. Specifically, to increase speed within the entire manufacturing process,

multiple workstations performing the identical operation are provided. Thus, if one workstation becomes inoperable, the entire manufacturing process is not slowed. Only one workstation within a group of workstations performing identical machining operations will operate on a workpiece. Further, different workpieces may be processed side by side and simultaneously within neighboring workstations performing the identical machining operations. In order to provide a system with maximum efficiency, the workstations are loaded based on call signals, wherein the workstation supplying the oldest call is loaded first as long as it has also not provided an error signal. Head '605 does not teach or suggest this type of workstation redundancy, and as previously stated does not teach or suggest this efficient loading method. Rather, Head '605 suggests the possibility of repeatedly passing a workpiece through the same machine to perform similar steps. This is in sharp contrast to Applicant's claimed method. Reconsideration and withdrawal of the rejection of claim 9 and claim 10 that depends therefrom is requested.

With regard to claim 11, Head '605 does not teach or suggest "moving the carriage with the worked-upon one of the workpieces to a drop-off station; and depositing the worked-upon one of the workpieces in the drop-off station" as required. Head '605 simply teaches moving the workpieces from one station to another without any sort of dedicated drop off position. Reconsideration of claim 11 and claims 12 and 13 that depend therefrom is requested.

Claims 24-26 depend directly or indirectly from claim 21. As previously stated during the discussion of claim 21, for either the first or second zone a step wherein for all received call signals from the workstations, "determining a selected one of the call
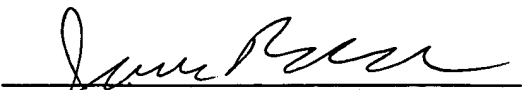
signals which is the oldest one of the call signals that has not been responded to and has not come from a workstation that has also transmitted an error signal." The teachings of Head '605 also do not suggest this step in the claimed method of operation. Rather, as noted previously, Head '605 teaches a computer system controller that will simply process a request from a downstream work station requesting a workpiece from an upstream work station. Reconsideration and withdrawal of the rejection of claims 24-26 is requested.

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 18-0160, our Order No. HON-14852.

Respectfully submitted,

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